

KS-21439 DATA CARTRIDGE

DESCRIPTION, PROCUREMENT, AND HANDLING

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1. GENERAL

1.01 This section covers the KS-21439 1/4-inch tape data cartridge (Fig. 1) which is used with the KS-21447 mini-recorder.

1.02 This section is reissued for the following reasons:

- To add new Parts 2 and 7, and renumber the remaining parts and paragraphs
- To add new 5.03 and 6.03
- To expand 3.02, 3.03, 5.01, 5.02, 6.01, and 6.02
- To change 4.01 to add a second supplier.

Since this reissue covers a general revision, arrows ordinarily used to indicate changes have been omitted.

1.03 The KS-21447 mini-recorder is covered in Sections 034-362-301, 034-362-701, and 034-362-801.

1.04 See Section 034-311-301 for magnetic tape management information, much of which is applicable to the tape used in the KS-21439 data cartridge.

2. DEFINITIONS

2.01 **Pass:** Unidirectional (forward or reverse) movement of a section of tape across the head.

2.02 **Tape Pass:** Unidirectional (forward or reverse) movement of the full length of tape between the beginning-of-tape (BOT) and the end-of-tape (EOT) across the head.

2.03 **Retensioning Cycle:** The movement of tape from BOT to EOT and back to BOT at a continuous speed not to exceed 90 inches per second.

3. DESCRIPTION

3.01 **Magnetic Tape:** The 1/4-inch magnetic tape in the cartridge has the same performance characteristics as the 1/2-inch tape that is familiar to users of large computer-compatible digital recording systems with one advantage. Because of the different configuration in the cartridge, the cartridge tape is difficult to "cinch"; ie, develop lateral creases which damage the oxide layer. The tape ends are manufactured with a series of consecutive holes of a certain pattern to activate the BOT and EOT controls.

3.02 **Cartridge Drive Belt:** The drive belt has two main functions:

- (1) To move the tape from reel to reel
- (2) To control tape tension.

The belt compliance generates tape tension in the range of 1.5 to 4 ounces during the time the

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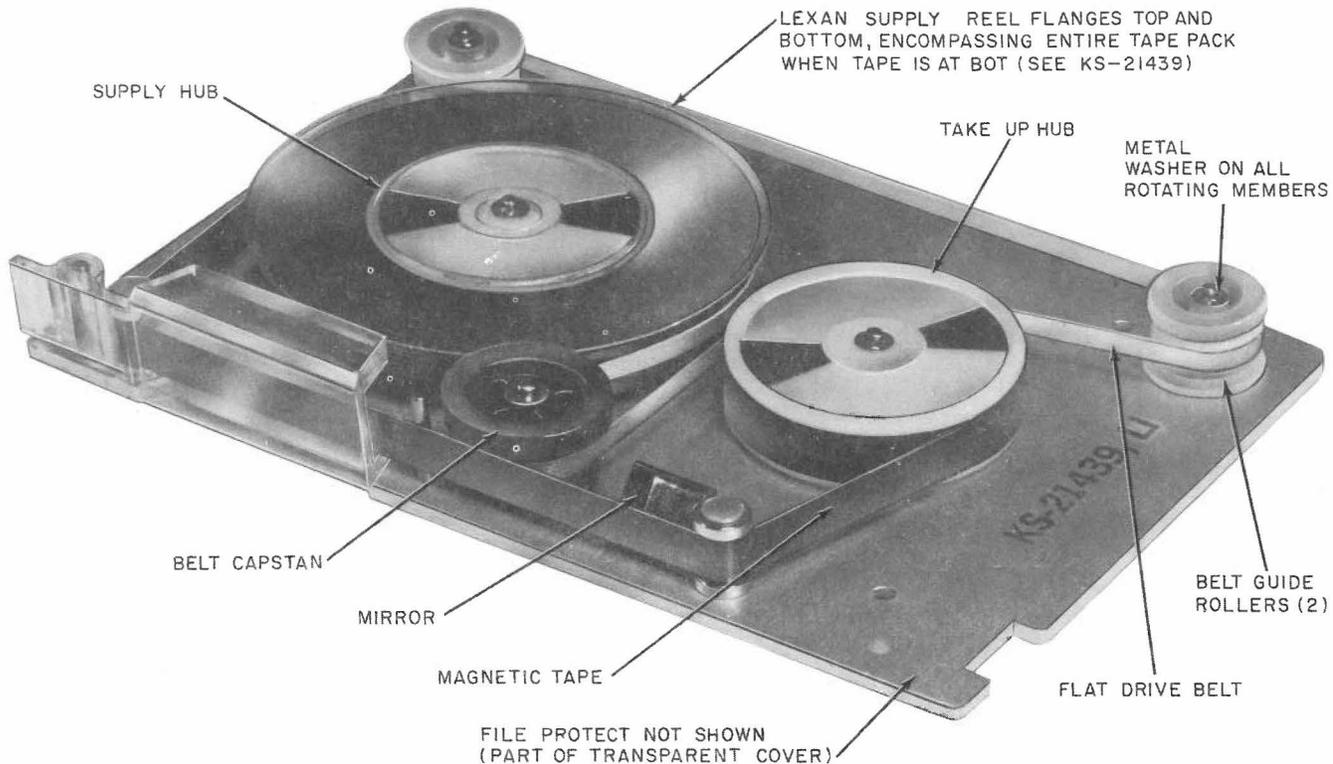


Fig. 1—KS-21439 Data Cartridge (Cover Removed)

cartridge is in motion. The belt is driven from a drive pulley in the cartridge which is itself driven by a capstan on the mini-recorder drive motor shaft. It is an inherent capability of the cartridge design that it can recover from losses of tension within two retensioning cycles.

3.03 Cartridge Case: The plastic cartridge case is equipped with a feature which makes it possible to safeguard data from accidental erasure. When in the SAFE position, the actuating arm of the WRITE-ENABLE microswitch (located in the mini-recorder) remains unactuated, thus preventing writing. Switching the cartridge case to SAFE (WRITE-DISABLED) is accomplished with a screwdriver. When the cartridge is outside of a recorder, the case is essentially a complete enclosure. When the cartridge is engaged in a recorder, magnetic head access to the tape is by means of a protective door which swings away during the process of loading the cartridge in the mini-recorder.

4. PROCUREMENT

4.01 The unrecorded KS-21439 data cartridge may be obtained from the following sources:

- 3M Company
3M Center
St Paul, Minnesota 55101
Building 223-5E
Attention: Mincom Division
- Information Terminals Corporation
323 Soquel Way
Sunnyvale, California 94086
Attention: Manager Product
Management—Marketing

These are to be ordered under an arrangement negotiated by the Western Electric Company. Minimum ordering quantity increment is 50.

5. HANDLING

5.01 Using the Data Cartridge: The following precautions should be observed in using the data cartridge. This is especially important when operation outside a "safe limit" temperature range of 60 to 100°F is anticipated. Instructions for operating the mini-recorder are covered in Section 034-362-301.

- (a) If the system has not otherwise been operating during large temperature excursions of approximately 30°F, the using system should be programmed to make a retensioning cycle as defined in 2.03 at approximately every 30 degrees of excursion.
- (b) If automatic retensioning is not possible, then before attempting to read after a large temperature excursion, make a retensioning cycle as defined in 2.03.
- (c) In as much as possible, the mini-recorder should be located where temperature changes will be minimized.
- (d) Write critical data in the mid 200 feet of tape, preferably on tracks one and two (middle of tape).
- (e) If a data cartridge fails to perform satisfactorily, it should be replaced. Field repair of data cartridges is not recommended. It is recommended that, catastrophic failures aside, acceptability of a cartridge be determined by an error audit and not by some presumed or nominal life (number of passes).
- (f) The components internal to the tape cartridge are designed to have a useful life typical of high quality applications of magnetic tape. No maintenance (such as lubrication) is required. In fact none should be attempted for the likely outcome is adulteration of the tape.
- (g) Like other magnetic tape media, the data cartridge cannot be guaranteed to be 100 percent error free under all circumstances. Since strong measures have been taken in its manufacture and initial recording (where applicable) to minimize the occurrence of errors, it is in its initial application that the integrity of the data cartridge is at its utmost. Therefore, in applications where **no** errors are tolerable or an occurrence of an

error constitutes a system failure, employment of previously used cartridges should be prohibited.

5.02 Cartridge Not in Use

- (1) To maximize cartridge performance, it is advisable to make a retensioning pass on a cartridge which:
 - (a) Is new or has just been loaded into a mini-recorder subsequent to having been exposed to an indeterminate environment. This should be done as close to room temperature as possible.
 - (b) Has been exposed to a temperature change of 30°F or more.
 - (c) Has not been operated for more than 72 hours.
- (2) For storage and/or transportation instructions, see Part 6.
- (3) The position of the tape when not in use should be at BOT. The tape pack in this position is encompassed by the supply reel flanges which protect it from damage when initially used after a temperature excursion.
- (4) The cartridge should at all times be either fully engaged in the mini-recorder or be properly stored as defined in 5.03, 6.01, and 6.03.

5.03 Shipping Container: Unrecorded cartridges are shipped individually wrapped in a sealed plastic bag enclosed in a cardboard box. They are further boxed in a 5-cartridge pack and a 50-cartridge carton. This packing echelon should be maintained for subsequent storage or shipping of recorded or unrecorded cartridges. However, for individual storage or shipping of cartridges, at least the sealed plastic bag and cardboard box combination should be used. In addition for shipping, this combination should be packed in envelopes of plastic "bubble pack" material.

6. ENVIRONMENT

6.01 Storage and Transportation Temperature: The cartridge short term (72 hours) storage and transportation temperature limits are -40 to +135°F.

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These limits apply to both unrecorded and recorded cartridges. However, for long term storage, especially of recorded cartridges, an area controlled from 60 to 100°F is recommended.

6.02 Operational Temperature: The KS-21447 cartridge transport is designed to operate the cartridge in the temperature range of 0 to +135°F.

6.03 Humidity: The relative humidity limits for the operational as well as the storage and transportation environments are as follows:

TEMPERATURE °F	MAXIMUM R. H. %
Up to 90	80
100	58
110	43
120	33
130	24
135	22

6.04 Extreme Exposure: Cartridges exposed to extreme temperatures and humidity for significant periods, eg, 72 hours, may demonstrate increased error activity and should be replaced. If in an extreme or critical situation intolerable errors exist after making a total of two retensioning cycles, the cartridge should be replaced.

6.05 Magnetic Fields: Recorded cartridges shall not be subject to magnetic fields in excess of 35 gauss.

7. LABELING

7.01 The KS-21439 data cartridge label is designed to be applied to the upper and rear surfaces of the plastic case. Under no circumstances shall this label or any other be applied to the surface of the aluminum base closer than 1 inch from its edges.